

OIPE

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/722,602

DATE: 07/02/2001

TIME: 16:46:00

Input Set : A:\Seqlist.txt

Output Set: N:\CRF3\07022001\I722602.raw

4 <110> APPLICANT: ARNOLD, Frances H.
 5 PETROUNIA, Ionna P.
 6 SUN, Lianhong
 8 <120> TITLE OF INVENTION: DIRECTED EVOLUTION OF OXIDASE ENZYMES
 11 <130> FILE REFERENCE: 9373/1G811US1
 13 <140> CURRENT APPLICATION NUMBER: US 09/722,602
 14 <141> CURRENT FILING DATE: 2000-11-27
 16 <150> PRIOR APPLICATION NUMBER: US 09/571,553
 17 <151> PRIOR FILING DATE: 2000-05-16
 19 <160> NUMBER OF SEQ ID NOS: 36
 21 <170> SOFTWARE: FastSEQ for Windows Version 3.0
 23 <210> SEQ ID NO: 1
 24 <211> LENGTH: 36
 25 <212> TYPE: DNA
 26 <213> ORGANISM: Artificial Sequence
 28 <220> FEATURE:
 29 <223> OTHER INFORMATION: Primer
 31 <400> SEQUENCE: 1
 32 aattcgaagc ttatggcctc agcacctatc ggaagc 36
 34 <210> SEQ ID NO: 2
 35 <211> LENGTH: 33
 36 <212> TYPE: DNA
 37 <213> ORGANISM: Artificial Sequence
 39 <220> FEATURE:
 40 <223> OTHER INFORMATION: Primer
 42 <400> SEQUENCE: 2
 43 cttccttcta gattactgag taacgcgaat cgt 33
 45 <210> SEQ ID NO: 3
 46 <211> LENGTH: 30
 47 <212> TYPE: DNA
 48 <213> ORGANISM: Artificial Sequence
 50 <220> FEATURE:
 51 <223> OTHER INFORMATION: Primer
 53 <400> SEQUENCE: 3
 54 ggaagagaat tcaatacgca aaccgcctct 30
 56 <210> SEQ ID NO: 4
 57 <211> LENGTH: 32
 58 <212> TYPE: DNA
 59 <213> ORGANISM: Artificial Sequence
 61 <220> FEATURE:
 62 <223> OTHER INFORMATION: Primer
 64 <400> SEQUENCE: 4
 65 ggtcataagg ttttccctgtg tgaaattttt at 32
 67 <210> SEQ ID NO: 5
 68 <211> LENGTH: 30
 69 <212> TYPE: DNA
 70 <213> ORGANISM: Artificial Sequence

ENTERED

Q.S

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/722,602

DATE: 07/02/2001

TIME: 16:46:00

Input Set : A:\Seqlist.txt

Output Set: N:\CRF3\07022001\I722602.raw

72 <220> FEATURE:
 73 <223> OTHER INFORMATION: Primer
 75 <400> SEQUENCE: 5
 76 accatgattt cgacgtcggt accctcagca 30
 78 <210> SEQ ID NO: 6
 79 <211> LENGTH: 30
 80 <212> TYPE: DNA
 81 <213> ORGANISM: Artificial Sequence
 83 <220> FEATURE:
 84 <223> OTHER INFORMATION: Primer
 86 <400> SEQUENCE: 6
 87 cttcctaagc tttcactgag taacgcgaat 30
 89 <210> SEQ ID NO: 7
 90 <211> LENGTH: 30
 91 <212> TYPE: DNA
 92 <213> ORGANISM: Artificial Sequence
 94 <220> FEATURE:
 95 <223> OTHER INFORMATION: Primer
 97 <400> SEQUENCE: 7
 98 ggaagaggta ccaatacgca aaccgcctct 30
 100 <210> SEQ ID NO: 8
 101 <211> LENGTH: 29
 102 <212> TYPE: DNA
 103 <213> ORGANISM: Artificial Sequence
 105 <220> FEATURE:
 106 <223> OTHER INFORMATION: Primer
 108 <400> SEQUENCE: 8
 109 ttgttcctgc ggctgcagca attgaaccg 29
 111 <210> SEQ ID NO: 9
 112 <211> LENGTH: 30
 113 <212> TYPE: DNA
 114 <213> ORGANISM: Artificial Sequence
 116 <220> FEATURE:
 117 <223> OTHER INFORMATION: Primer
 119 <400> SEQUENCE: 9
 120 tgccggtcga ctctagatta ctgagtaacg 30
 122 <210> SEQ ID NO: 10
 123 <211> LENGTH: 639
 124 <212> TYPE: PRT
 125 <213> ORGANISM: Dactylium dendroides
 127 <400> SEQUENCE: 10
 128 Ala Ser Ala Pro Ile Gly Ser Ala Ile Ser Arg Asn Asn Trp Ala Val
 129 1 5 10 15
 130 Thr Cys Asp Ser Ala Gln Ser Gly Asn Glu Cys Asn Lys Ala Ile Asp
 131 20 25 30
 132 Gly Asn Lys Asp Thr Phe Trp His Thr Phe Tyr Gly Ala Asn Gly Asp
 133 35 40 45
 134 Pro Lys Pro Pro His Thr Tyr Thr Ile Asp Met Lys Thr Thr Gln Asn
 135 50 55 60

RAW SEQUENCE LISTING
PATENT APPLICATION: US/09/722,602

DATE: 07/02/2001
TIME: 16:46:00

Input Set : A:\Seqlist.txt
Output Set: N:\CRF3\07022001\I722602.raw

136 Val Asn Gly Leu Ser Met Leu Pro Arg Gln Asp Gly Asn Gln Asn Gly
137 65 70 75 80
138 Trp Ile Gly Arg His Glu Val Tyr Leu Ser Ser Asp Gly Thr Asn Trp
139 85 90 95
140 Gly Ser Pro Val Ala Ser Gly Ser Trp Phe Ala Asp Ser Thr Thr Lys
141 100 105 110
142 Tyr Ser Asn Phe Glu Thr Arg Pro Ala Arg Tyr Val Arg Leu Val Ala
143 115 120 125
144 Ile Thr Glu Ala Asn Gly Gln Pro Trp Thr Ser Ile Ala Glu Ile Asn
145 130 135 140
146 Val Phe Gln Ala Ser Ser Tyr Thr Ala Pro Gln Pro Gly Leu Gly Arg
147 145 150 155 160
148 Trp Gly Pro Thr Ile Asp Leu Pro Ile Val Pro Ala Ala Ala Ile
149 165 170 175
150 Glu Pro Thr Ser Gly Arg Val Leu Met Trp Ser Ser Tyr Arg Asn Asp
151 180 185 190
152 Ala Phe Gly Gly Ser Pro Gly Gly Ile Thr Leu Thr Ser Ser Trp Asp
153 195 200 205
154 Pro Ser Thr Gly Ile Val Ser Asp Arg Thr Val Thr Val Thr Lys His
155 210 215 220
156 Asp Met Phe Cys Pro Gly Ile Ser Met Asp Gly Asn Gly Gln Ile Val
157 225 230 235 240
158 Val Thr Gly Gly Asn Asp Ala Lys Lys Thr Ser Leu Tyr Asp Ser Ser
159 245 250 255
160 Ser Asp Ser Trp Ile Pro Gly Pro Asp Met Gln Val Ala Arg Gly Tyr
161 260 265 270
162 Gln Ser Ser Ala Thr Met Ser Asp Gly Arg Val Phe Thr Ile Gly Gly
163 275 280 285
164 Ser Trp Ser Gly Gly Val Phe Glu Lys Asn Gly Glu Val Tyr Ser Pro
165 290 295 300
166 Ser Ser Lys Thr Trp Thr Ser Leu Pro Asn Ala Lys Val Asn Pro Met
167 305 310 315 320
168 Leu Thr Ala Asp Lys Gln Gly Leu Tyr Arg Ser Asp Asn His Ala Trp
169 325 330 335
170 Leu Phe Gly Trp Lys Lys Gly Ser Val Phe Gln Ala Gly Pro Ser Thr
171 340 345 350
172 Ala Met Asn Trp Tyr Tyr Thr Ser Gly Ser Gly Asp Val Lys Ser Ala
173 355 360 365
174 Gly Lys Arg Gln Ser Asn Arg Gly Val Ala Pro Asp Ala Met Cys Gly
175 370 375 380
176 Asn Ala Val Met Tyr Asp Ala Val Lys Gly Lys Ile Leu Thr Phe Gly
177 385 390 395 400
178 Gly Ser Pro Asp Tyr Gln Asp Ser Asp Ala Thr Thr Asn Ala His Ile
179 405 410 415
180 Ile Thr Leu Gly Glu Pro Gly Thr Ser Pro Asn Thr Val Phe Ala Ser
181 420 425 430
182 Asn Gly Leu Tyr Phe Ala Arg Thr Phe His Thr Ser Val Val Leu Pro
183 435 440 445
184 Asp Gly Ser Thr Phe Ile Thr Gly Gly Gln Arg Arg Gly Ile Pro Phe

RAW SEQUENCE LISTING
PATENT APPLICATION: US/09/722,602

DATE: 07/02/2001
TIME: 16:46:00

Input Set : A:\Seqlist.txt
Output Set: N:\CRF3\07022001\I722602.raw

185 450 455 460
 186 Glu Asp Ser Thr Pro Val Phe Thr Pro Glu Ile Tyr Val Pro Glu Gln
 187 465 470 475 480
 188 Asp Thr Phe Tyr Lys Gln Asn Pro Asn Ser Ile Val Arg Val Tyr His
 189 485 490 495
 190 Ser Ile Ser Leu Leu Leu Pro Asp Gly Arg Val Phe Asn Gly Gly Gly
 191 500 505 510
 192 Gly Leu Cys Gly Asp Cys Thr Thr Asn His Phe Asp Ala Gln Ile Phe
 193 515 520 525
 194 Thr Pro Asn Tyr Leu Tyr Asn Ser Asp Gly Asn Leu Ala Thr Arg Pro
 195 530 535 540
 196 Lys Ile Thr Arg Thr Ser Thr Gln Ser Val Lys Val Gly Gly Arg Ile
 197 545 550 555 560
 198 Thr Ile Ser Thr Asp Ser Ser Ile Ser Lys Ala Ser Leu Ile Arg Tyr
 199 565 570 575
 200 Gly Thr Ala Thr His Thr Val Asn Thr Asp Gln Arg Arg Ile Pro Leu
 201 580 585 590
 202 Thr Leu Thr Asn Asn Gly Gly Asn Ser Tyr Ser Phe Gln Val Pro Ser
 203 595 600 605
 204 Asp Ser Gly Val Ala Leu Pro Gly Tyr Trp Met Leu Phe Val Met Asn
 205 610 615 620
 206 Ser Ala Gly Val Pro Ser Val Ala Ser Thr Ile Arg Val Thr Gln
 207 625 630 635
 209 <210> SEQ ID NO: 11
 210 <211> LENGTH: 639
 211 <212> TYPE: PRT
 212 <213> ORGANISM: Dactylium dendroides
 214 <400> SEQUENCE: 11
 215 Ala Ser Ala Pro Ile Gly Ser Ala Ile Ser Arg Asn Asn Trp Ala Val
 216 1 5 10 15
 217 Thr Cys Asp Ser Ala Gln Ser Gly Asn Glu Cys Asn Lys Ala Ile Asp
 218 20 25 30
 219 Gly Asn Lys Asp Thr Phe Trp His Thr Phe Tyr Gly Ala Asn Gly Asp
 220 35 40 45
 221 Pro Lys Pro Pro His Thr Tyr Thr Ile Asp Met Lys Thr Thr Gln Asn
 222 50 55 60
 223 Val Asn Gly Leu Ser Met Leu Pro Arg Gln Asp Gly Asn Gln Asn Gly
 224 65 70 75 80
 225 Trp Ile Gly Arg His Glu Val Tyr Leu Ser Ser Asp Gly Thr Asn Trp
 226 85 90 95
 227 Gly Ser Pro Val Ala Ser Gly Ser Trp Phe Ala Asp Ser Thr Thr Lys
 228 100 105 110
 229 Tyr Ser Asn Phe Glu Thr Arg Pro Ala Arg Tyr Val Arg Leu Val Ala
 230 115 120 125
 231 Ile Thr Glu Ala Asn Gly Gln Pro Trp Thr Ser Ile Ala Glu Ile Asn
 232 130 135 140
 233 Val Phe Gln Ala Ser Ser Tyr Thr Ala Pro Gln Pro Gly Leu Gly Arg
 234 145 150 155 160
 235 Trp Gly Pro Thr Ile Asp Leu Pro Ile Val Pro Ala Ala Ala Ile

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/722,602

DATE: 07/02/2001

TIME: 16:46:00

Input Set : A:\Seqlist.txt

Output Set: N:\CRF3\07022001\I722602.raw

236	165	170	175
237	Glu Pro Thr Ser Gly Arg Val Leu Met Trp Ser Ser Tyr Arg Asn Asp		
238	180	185	190
239	Ala Phe Gly Gly Ser Pro Gly Gly Ile Thr Leu Thr Ser Ser Trp Asp		
240	195	200	205
241	Pro Ser Thr Gly Ile Val Ser Asp Arg Thr Val Thr Val Thr Lys His		
242	210	215	220
243	Asp Met Phe Cys Pro Gly Ile Ser Met Asp Gly Asn Gly Gln Ile Val		
244	225	230	235
245	Val Thr Gly Gly Asn Asp Ala Lys Lys Thr Ser Leu Tyr Asp Ser Ser		
246	245	250	255
247	Ser Asp Ser Trp Ile Pro Gly Pro Asp Met Gln Val Ala Arg Gly Tyr		
248	260	265	270
249	Gln Ser Ser Ala Thr Met Ser Asp Gly Arg Val Phe Thr Ile Gly Gly		
250	275	280	285
251	Ser Trp Ser Gly Gly Val Phe Glu Lys Asn Gly Glu Val Tyr Ser Pro		
252	290	295	300
253	Ser Ser Lys Thr Trp Thr Ser Leu Pro Asn Ala Lys Val Asn Pro Met		
254	305	310	315
255	Leu Thr Ala Asp Lys Gln Gly Leu Tyr Arg Ser Asp Asn His Ala Trp		
256	325	330	335
257	Leu Phe Gly Trp Lys Lys Gly Ser Val Phe Gln Ala Gly Pro Ser Thr		
258	340	345	350
259	Ala Met Asn Trp Tyr Tyr Thr Ser Gly Ser Gly Asp Val Lys Ser Ala		
260	355	360	365
261	Gly Lys Arg Gln Ser Asn Arg Gly Val Ala Pro Asp Ala Met Cys Gly		
262	370	375	380
263	Asn Ala Val Met Tyr Asp Ala Val Lys Gly Lys Ile Leu Thr Phe Gly		
264	385	390	395
265	Gly Ser Pro Asp Tyr Gln Asp Ser Asp Ala Thr Thr Asn Ala His Ile		
266	405	410	415
267	Ile Thr Leu Gly Glu Pro Gly Thr Ser Pro Asn Thr Val Phe Ala Ser		
268	420	425	430
269	Asn Gly Leu Tyr Phe Ala Arg Thr Phe His Thr Ser Val Val Leu Pro		
270	435	440	445
271	Asp Gly Ser Thr Phe Ile Thr Gly Gly Gln Arg Arg Gly Ile Pro Phe		
272	450	455	460
273	Glu Asp Ser Thr Pro Val Phe Thr Pro Glu Ile Tyr Val Pro Glu Gln		
274	465	470	475
275	Asp Thr Phe Tyr Lys Gln Asn Pro Asn Ser Ile Val Arg Ala Tyr His		
276	485	490	495
277	Ser Ile Ser Leu Leu Pro Asp Gly Arg Val Phe Asn Gly Gly Gly		
278	500	505	510
279	Gly Leu Ser Gly Asp Cys Thr Thr Asn His Phe Asp Ala Gln Ile Phe		
280	515	520	525
281	Thr Pro Asn Tyr Leu Tyr Asn Ser Asn Gly Asn Leu Ala Thr Arg Pro		
282	530	535	540
283	Lys Ile Thr Arg Thr Ser Thr Gln Ser Val Lys Val Gly Gly Arg Ile		
284	545	550	555
			560

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

VERIFICATION SUMMARY

PATENT APPLICATION: US/09/722,602

DATE: 07/02/2001

TIME: 16:46:01

Input Set : A:\Seqlist.txt

Output Set: N:\CRF3\07022001\I722602.raw

L:1240 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:28